Fundamentals
M7
MAINTENANCE PRACTICES

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M7.10
Springs

EASA Part-66
CAT B1

Training Manual

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Lufthansa Technical Training

Dept HAM US
Lufthansa Base Hamburg
Weg beim Jäger 193
22335 Hamburg
Germany

Tel: +49 (0)40 5070 2520
Fax: +49 (0)40 5070 4746
E-Mail: Customer-Service@LTT.DLH.DE

www.Lufthansa-Technical-Training.com

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M7 MAINTENANCE PRACTICES

M7.10 SPRINGS

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INSPECTION AND TESTING OF SPRINGS

General

Springs are elastic devices variously used for:

- Storing and furnishing energy
- Absorbing shocks
- Sustaining the pressure between contacting surfaces
- Resisting tensional or compressional stress

Materials

Springs are made of an elastic material, e.g. specially formulated steel alloys or certain types of rubber or plastic.

Types of springs

A torsion spring that stores energy, e.g. for operating a watch, is a metal strip wound spirally around a fixed center.

For reducing concussion in some heavy trucks and railroad cars, helical (or coil) springs are used. Coil springs are commonly used for the same purpose in motor cars, as are leaf springs that consist of flat bars clamped together. These have been replaced in some vehicles by torsion bars that absorb stresses by twisting.

The helical−coil compression spring provides the force to keep the operating surfaces together in the friction clutch.

The extension spring is employed for a spring balance; the distance through which it is extended depends on the weight suspended from it.

The disk spring, which consists of a laminated series of convex discs, is widely employed for heavy loads.

Example Airbus A340 Main Landing Gear Lock Springs - Inspection

1. Ensure that the tension springs (1) are correctly attached to the sidestay and the lockstay.
2. Examine the tension springs (1) for:
   - Impact damage,
   - distortion,
   - scores,
   - corrosion.
3. Examine the end fittings of the tension springs (1) for:
   - Damage,
   - cracks,
   - corrosion.
4. Move the tension springs (1) around their longitudinal axis. Ensure that the tension springs (1) are free to move in their end bearings.
5. Ensure that the spring eye−ends at the side−stay end are correctly attached to the inner retainer spring.
6. Ensure that the cotter pins (2) and (3) are serviceable and correctly installed.
7. Ensure that the tension springs (1) do not touch the edges of the side stay.

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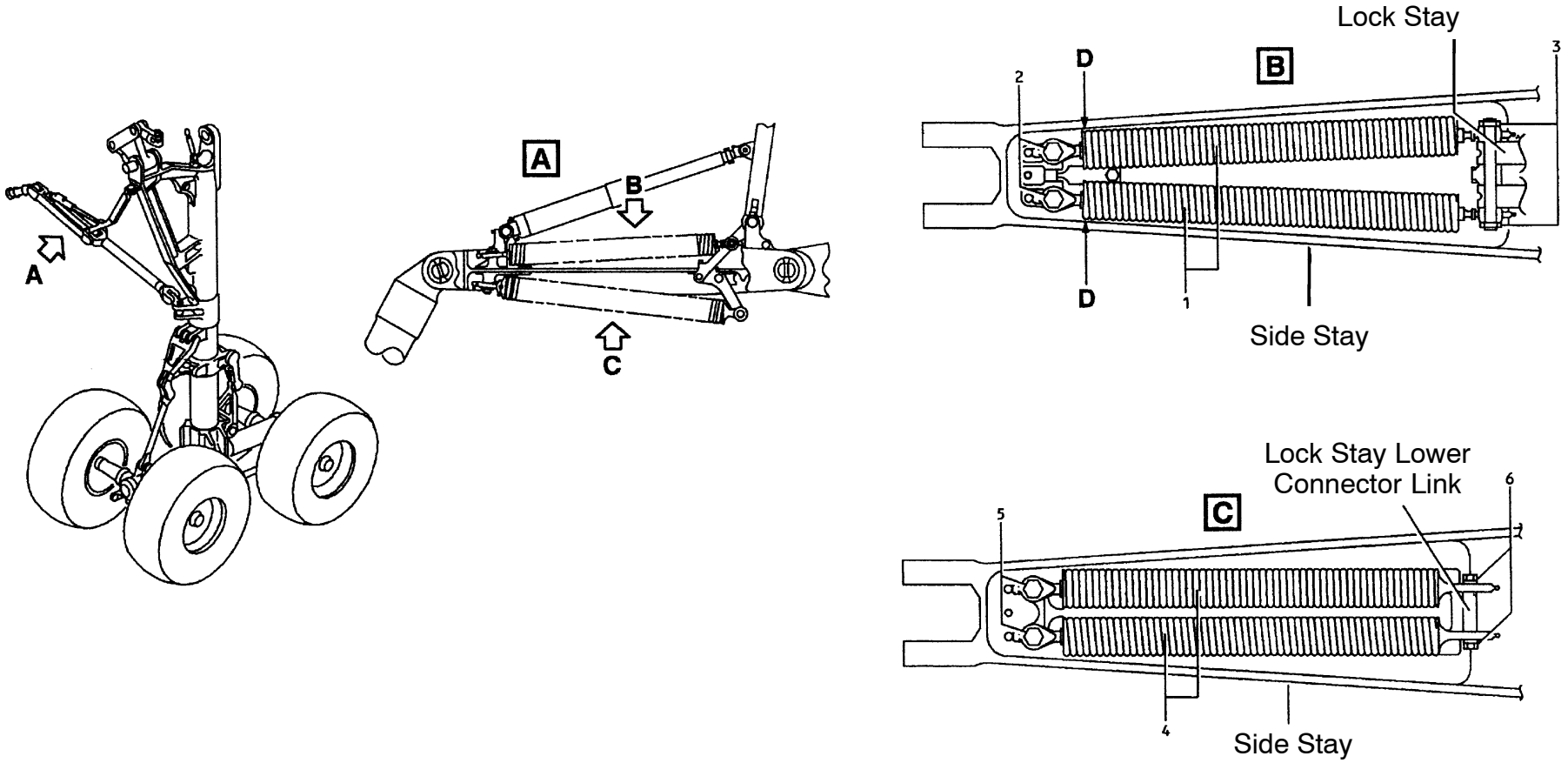


Figure 1 Airbus A340 Main Landing Gear Lock Springs

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Inspection and Testing of Springs

Checking Springs for Wear

Before testing, the spring should be always visually inspected. Special care should be given to the hooks where they connect to their mounting points.

Measuring the Spring Tension

Springs can be proofed with measuring equipment as shown in Figure 255. The way to do this is to compress or pull (depends on the spring type) to a given length and to read the measured value.

The spring tension should then be within the limits given in the manufacturers datasheet. If a spring is out of limit, the spring has to be replaced according to the Illustrated Parts Catalog related to the Aircraft.

The spring test diagram shows a extension spring test where the measured value are out of the given limits.

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Test Equipment

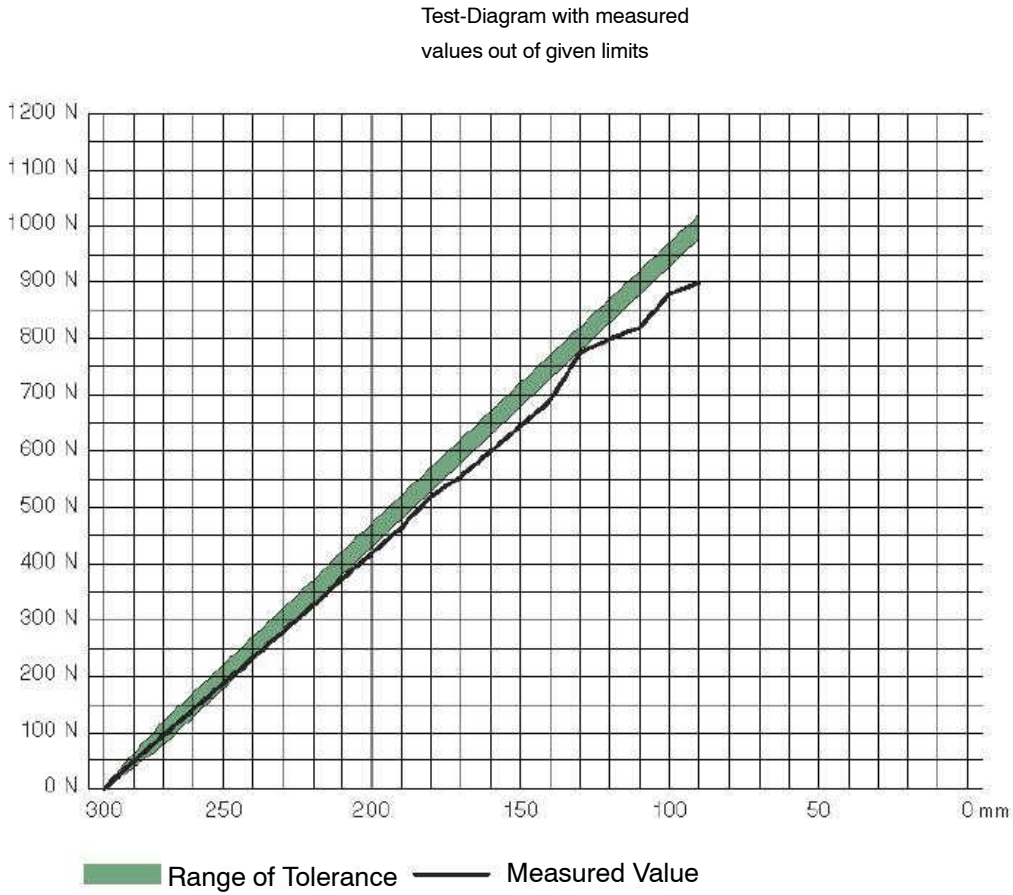


Figure 2 Testing of Springs

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